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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/700,973	11/04/2003	Vince Winstead	81044474 (202-0383)	4494
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TUNG & ASSOCIATES 838 WEST LONG LAKE, SUITE 120 BLOOMFIELD HILLS, MI 48302			EXAMINER LEE, CYNTHIA K	
			ART UNIT	PAPER NUMBER
			1795	
			MAIL DATE	DELIVERY MODE
			05/28/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/700,973

Applicant(s)

WINSTEAD, VINCE

Examiner

CYNTHIA LEE

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Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 20-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 20-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

Response to Amendment

This Office Action is responsive to the amendment filed on 2/22/2008. Claims 7-19 have been canceled and claims 20-33 have been added. Claims 1-6 and 20-33 are pending. Applicant's arguments have been fully considered and are persuasive. However, upon further consideration, the instant claims are rejected under new grounds of rejections and thus, claims 1-6 and 20-33 are finally rejected for reasons necessitated by applicant's amendment.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-6 and 20-33 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "said first and second value are greater than zero" is not supported by the disclosure as originally filed. It appears that the Applicant is relying on pgs 5 and 7 of the Specification for support. However, it is noted that these portions of the Specification does not support that "said first and second value are greater than zero".

Applicant is required to cancel the new matter in reply to this Office Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claims 1, 2, 5, 20-22 are rejected under 35 U.S.C. 102(a) as being anticipated by Sugiura (US 2003/0118876).

Sugiura discloses a power supply apparatus including a fuel cell system and a secondary battery [0037]. The apparatus includes a SOC (state of charge) monitor that detects the remaining capacity of the battery. The SOC is detected by measuring the voltage level of the battery [0040].

In a normal operating mode, the electric power is outputted by the fuel cell based on the electric power needed to achieve the desired drive state and the electric power needed by the high voltage auxiliary devices and the SOC of the battery [0046]. When the size of the load equals or exceeds a predetermined upper limit (Applicant's claim 2) and the SOC of the secondary battery 26 is sufficiently large, electric power is also supplied to the load devices by the secondary battery 26 (Applicant's second value). In this case, the controller 48 determines the amount of electric power to be output by the fuel cell 60 and sets a target voltage in the DC/DC converter 28 accordingly taking into account the fact that electric power will also be supplied from the secondary battery 26. As shown in FIG. 3, the output voltage of the fuel cell 60 falls as the load and output current increase. In addition, the secondary battery 26 has the characteristic that its output voltage rises as its SOC increases. Consequently, electric power is supplied to

the high-voltage auxiliary devices 40 or the drive motor 32 from the secondary battery 26 as well. [0047]

A fuel cell suspended mode is carried out when the energy efficiency of the fuel cell system falls below a predetermined value. The fuel cell current and voltage output are determined and if the fuel cell voltage is below the wiring voltage, the controller outputs a signal to the switches to open. Upon opening the switches, electric power begins to be supplied to the load by the capacitor [0061]. The electric power may also be supplied to the load by the battery [0066] (Applicant's first value).

Claims 4 and 6 are rejected under 35 U.S.C. 102(a) as being anticipated by Sugiura (US 2003/0118876) as applied to claim 1, as evidenced by Ulmer (US 2005/0069740).

Regarding claim 4, Sugiura discloses that the power to the load is supplied by the battery when the energy efficiency of the fuel cell system falls below a predetermined value, in which the fuel cell current and voltage output are determined [0066]. Thus, the power output of the battery (applicant's first value) depends on the fuel cell voltage. The Examiner notes that a fuel cell voltage is defined as $V_{fc} = \eta_{eff}/EMF$, where EMF is the open circuit voltage. $V_{fc} = \eta_{eff}/V_{ocv}$. See Ulmer par. [0035]. V_{ocv} is also maximum voltage of the fuel cell. Thus, Sugiura discloses that the output of the battery necessarily is based on the maximum voltage of the fuel cell. Further,

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the battery is used to power the load when the SOC of the battery is sufficiently high [0066].

Regarding claim 6, Sugiura discloses that the power is supplied from the battery when the size of the load equals or exceeds the upper limit of the fuel cell [0047].

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiura (US 2003/0118876) as applied to claim 1, in view of Hochgraf (US 2003/0044658).

Sugiura's apparatus mode depends on the power supply requirement of the load (i.e. the driving mode of the electric vehicle). Thus, the steps of A-C of Applicant will be repeated in the use of the power supply apparatus of Sugiura as the driver of the electric vehicle of Sugiura experiences the various modes of operation. Sugiura discloses that the SOC of the secondary battery is kept above a predetermined limit, but does not a range. Hochgraf teaches that the SOC of the energy storage device is controlled. By controlling the SOC, the life of the energy storage device is extended and an adequate reserve energy margin is maintained. The reserve energy makes it possible to handle temporary high-load current conditions that are due to fluctuations [0036]. It would have been obvious to one of ordinary skill in the art at the time the

invention was made to control the SOC according to various SOC necessary to protect the battery and reserve adequate energy for unforeseen high load demand.

Claim 23, 24, 26-29, 30, 32, 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiura (US 2003/0118876) in view of Hochgraf (US 2003/0044658).

Sugiura discloses a power supply apparatus including a fuel cell system and a secondary battery [0037]. The apparatus includes a SOC (state of charge) monitor that detects the remaining capacity of the battery. The SOC is detected by measuring the voltage level of the battery [0040].

In a normal operating mode, the electric power is outputted by the fuel cell based on the electric power needed to achieve the desired drive state and the electric power needed by the high voltage auxiliary devices and the SOC of the battery [0046]. When the size of the load equals or exceeds a predetermined upper limit (Applicant's claim 2) and the SOC of the secondary battery 26 is sufficiently large, electric power is also supplied to the load devices by the secondary battery 26 (Applicant's second value). In this case, the controller 48 determines the amount of electric power to be output by the fuel cell 60 and sets a target voltage in the DC/DC converter 28 accordingly taking into account the fact that electric power will also be supplied from the secondary battery 26. As shown in FIG. 3, the output voltage of the fuel cell 60 falls as the load and output current increase. In addition, the secondary battery 26 has the characteristic that its output voltage rises as its SOC increases. Consequently, electric power is supplied to

the high-voltage auxiliary devices 40 or the drive motor 32 from the secondary battery 26 as well. [0047]

A fuel cell suspended mode is carried out when the energy efficiency of the fuel cell system falls below a predetermined value. The fuel cell current and voltage output are determined and if the fuel cell voltage is below the wiring voltage, the controller outputs a signal to the switches to open. Upon opening the switches, electric power begins to be supplied to the load by the capacitor [0061]. The electric power may also be supplied to the load by the battery [0066] (Applicant's first value).

Sugiura's apparatus mode depends on the power supply requirement of the load (i.e. the driving mode of the electric vehicle). Thus, the steps of A-C of Applicant will be repeated in the use of the power supply apparatus of Sugiura as the driver of the electric vehicle of Sugiura experiences the various modes of operation. Sugiura discloses that the SOC of the secondary battery is kept above a predetermined limit, but does not a range (Applicant's claim 23). Hochgraf teaches that the SOC of the energy storage device is controlled. By controlling the SOC, the life of the energy storage device is extended and an adequate reserve energy margin is maintained. The reserve energy makes it possible to handle temporary high-load current conditions that are due to fluctuations [0036]. It would have been obvious to one of ordinary skill in the art at the time the invention was made to control the SOC according to various SOC necessary to protect the battery and reserve adequate energy for unforeseen high load demand.

Claims 25 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sugiura (US 2003/0118876) in view of Hochgraf (US 2003/0044658) as applied to claims 23 and 30, as evidenced by Ulmer (US 2005/0069740).

Sugiura discloses that the power to the load is supplied by the battery when the energy efficiency of the fuel cell system falls below a predetermined value, in which the fuel cell current and voltage output are determined [0066]. Thus, the power output of the battery (applicant's first value) depends on the fuel cell voltage. The Examiner notes that a fuel cell voltage is defined as $V_{fc} = \eta_{eff}/EMF$, where EMF is the open circuit voltage. $V_{fc} = \eta_{eff}/V_{ocv}$. See Ulmer par. [0035]. V_{ocv} is also maximum voltage of the fuel cell. Thus, Sugiura discloses that the output of the battery necessarily is based on the maximum voltage of the fuel cell. Further, the battery is used to power the load when the SOC of the battery is sufficiently high [0066].

Response to Arguments

Applicant's arguments filed 2/22/2008 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia Lee whose telephone number is 571-272-8699. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Cynthia Lee/

Patent Examiner

/PATRICK RYAN/

Supervisory Patent Examiner, Art Unit 1795